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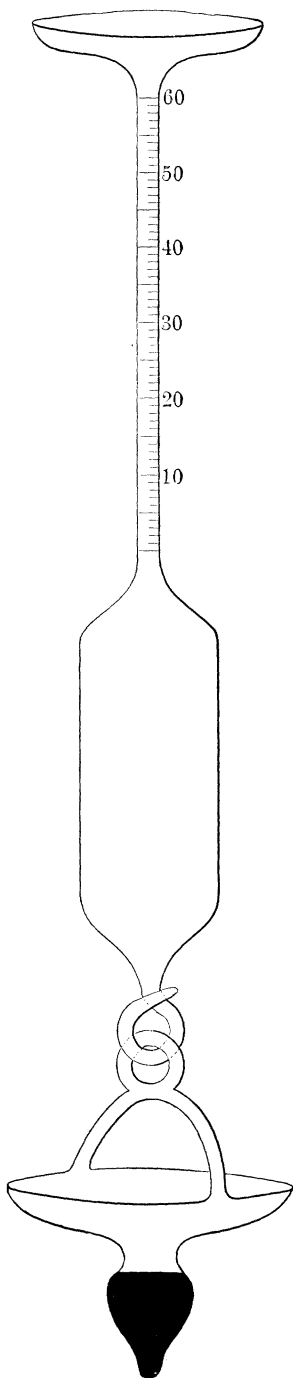
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A NEW FORM OF HYDROMETER.

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The writer has had charge of a large class in determinative mineralogy, and found it inconvenient and expensive to supply them with sufficient appliances for getting the specific gravity of the minerals. The Jolly balance answered a good purpose, the errors in its use not being greater than the variations in the gravity of the minerals themselves. But the price of the balance led to the wish for something equally rapid and accurate, and of such price that a number of them might be placed at the disposal of the students. He therefore devised a combination of the Nicholson and the Beaumé hydrometers, such that the work can be done with more satisfaction than with the Jolly balance, and the instrument is quite inexpensive. The accompanying cut will fully show its form.

It was neatly made for me by E. Greiner, of New York. Its essentials, of course, are the two pans and the graduated stem. The more slender the stem, the less, proportionately, the error in reading.

Its use is almost obvious from the instrument itself. There is no fixed water-line, but the graduation extends somewhat below the surface of the water as the unloaded instrument floats in its jar. The readings and calculations are exactly similar to those made in using the Jolly. First, the position of the instrument in the water is noted. This is best done by reading through the water (that is, at the lower instead of the upper surface of the film separating the water and the air), where the plane of the water cuts the stem. By this means, the meniscus gives no trouble. The solid is then placed in the upper pan and another reading taken. A third reading is taken, this time with the substance in the lower pan. The first reading subtracted from the second will give a number representing the weight of the substance; the third from the second, the displaced water. The gravity is then found in the usual way.

By making the stem small, the accuracy of the instrument is increased. In a comparison of one with the Jolly balance, I obtained these results with the same piece of barite: With the Jolly, 4.519, 4.523, 4.471, average 4.504, greatest difference .052; with the new hydrometer, 4.472, 4.475, 4.460, average 4.469, greatest difference .015. But it is not claimed that results are more accurate by this instrument than by the Jolly balance. It is cheaper and more convenient. I have observed that where both are accessible to students,

they will use the hydrometer in preference to the balance.